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Is Per Capita Income a True Indicator of Development?

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Abstract:

With the objective to find a summary statistics of development, this paper tries to gauge 'Per Capita Income', whether it actually can be termed as an indicator of development or one needs to look at some more indicators in the frame to visualize a country's development. This paper includes the structural or institutional indicators of development as: some health indicators like Life Expectancy and IMR, education indicator as the literacy rate, the demographic indicators like TFR and Population growth rate and some economic indicators like Population below poverty line and labor force in agriculture etc., and with all these variables the Per Capita Income has shown a high positive correlation.

Key words: Per Capita Income, Life Expectancy, TFR, IMR, Population Growth Rate, Correlation

1. Background

Development is a process, not a level. But there has been always a debate on the way of defining the Development of Countries. It is somewhat easier to say which countries are richer and which are poorer. But indicators of wealth, which reflect the quantity of resources available to a society, provide no information about the allocation of those resources—for instance, about more or less equitable distribution of income among social groups, about the shares of resources used to provide free health and education services, and about the effects of production and consumption on people's environment. Thus it is no wonder that countries with similar average incomes can differ substantially when it comes to people's quality of life: access to education and health care, employment opportunities, availability of clean air and safe drinking water, the threat of crime, and so on. With that in mind, how do we determine which countries are more developed and which are less developed?

There is no consensus among economists as to what constitute economic development. Economists who looked at development from structural change angle defined economic development as economic growth with structural change in favor of non-agricultural activities. Some economists emphasized the need for institutional changes to bring about structural transformation. By institutional changes they meant facilitating institutions like appropriate policies, systems of governance, markets, and attitudinal changes. etc. In this angle economic development is economic growth plus something. According to Seers (1979) the purpose of development is to reduce poverty, inequality, and unemployment. For Sen (1999), development involves reducing deprivation or broadening choice. Deprivation represents a multidimensional view of poverty that includes hunger, illiteracy, illness and poor health, powerlessness, voicelessness, insecurity, humiliation, and a lack of access to basic infrastructure. Income condition within the country can explain to a great extent development condition of the country. Economic development is the primary goal of majority of the countries, which would in turn lead to rise in income, well-being and economic capabilities of peoples everywhere. The minimum requirement for a nation to be called "developed" is the presence of high quality of life for all and this being not restricted to affluent few. The state of material well-being is captured by per capita gross national product: per head value of final goods and services produced by the people of a country over a given year. Economic development at a national level is adopted as a conscious goal, even though there are long phases during which development performance was judged exclusively by the yardstick of per capita gross domestic product growth. Economic development is not all about the income level of the country but it also depends upon various other indicators, associated with quality of life.

2. Statement of the Problem

A country's performance in terms of income per capita might be significantly different from the story told by the above mentioned basic indicators. There has been always a doubt that the Per Capita Income can be used as a summary statistic for the development of any country that is why United Nations Development Program (UNDP) has given the Human Development Index (HDI), which includes three components: Life expectancy at birth, Adult Literacy and Per Capita Income. But a group of main stream economists have their arguments as Per Capita Income may act as a good proxy for the development because of the fact that it ultimately makes the impact on the other indicators which are included in the list of development.

Here, the need, of analyzing the impact of Per Capita Income on the other development indicating variables, arises. In this paper various indicators like, life expectancy at birth, infant mortality rate, literacy, labor share in agriculture etc. have been taken to find out how the Per Capita Income of the country affect them.

3. Objective

The objective of this study is to measure the extent of impact of Per Capita Income of the country on the other development indicators as Health, Education and Economic Indicators and ultimately to see whether the Per Capita Income can act as an Index of Development. The study has been conducted for the countries with middle income level (Developing: Middle Bracket).

4. Data and Methodology

This study has used the following database:

- World Development Report (World Bank 2009-2010) for getting the data for the developing countries on variables like labor force in Agriculture, Population Growth rate, Population living below Poverty line etc.
- Human Development Report (United Nations Development Program, 2009) for getting the data for the developing countries on Life expectancy, Infant Mortality Rate, Literacy and Total Fertility Rate.

For getting the relationship between the development indicators, except the premiere measure that is the Correlation Coefficient, both the graphical and quantitative approaches have been made: the Scatter and the Bar Diagram has been used to have an eyeball of the relationship and the Linear Regression Analysis has been used to get the extent of that.

In some relationship, for a more convenient explanation the developing countries have been further divided into four groups according to the Per Capita Income levels. These groups are:

- Group 1: Countries with Per Capita Income up to \$500.
- Group 2: Countries with Per Capita Income from \$500 to \$1000.
- Group 3: Countries with Per Capita Income from \$1000 to \$2000.
- Group 4: Countries with Per Capita Income more than \$2000.

5. Analysis and Results

5.1. Per Capita Income and Life Expectancy for Developing Countries

VARIABLE	S.E.	BETA	SIG.
Per Capita Income (In \$)	.001	.343	.015

*Table 1: Linear Regression Coefficient: Per Capita Income on Life Expectancy
Dependent Variable: Life Expectancy (Years)*

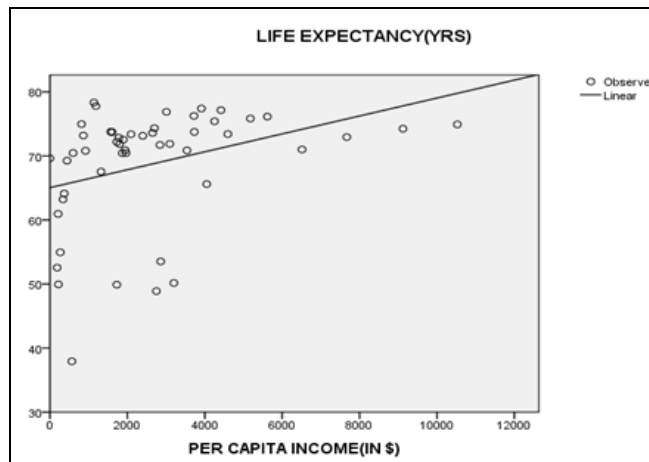


Fig. 1 Scatter Plot: Per Capita Income on Life Expectancy

From the scatter diagram a very strong relationship has been observed between the Per Capita Income and the life expectancy, as the level of income increases the life expectancy also attains a very high level.

The regression table and the Regression line in the Scatter Diagram as well are showing the significant positive value of Beta that is 0.343 which shows that the unit change in Per Capita Income will result the positive change of 3.43% in the life expectancy.

5.2. Per Capita Income and Literacy Rate for Developing Countries

VARIABLES	S.E.	BETA	SIG.
Per Capita Income (In \$)	.001	.450	.001

*Table 2: Linear Regression Coefficient: Per Capita Income On Literacy Rate
Dependent Variable: Literacy Rate(%)*

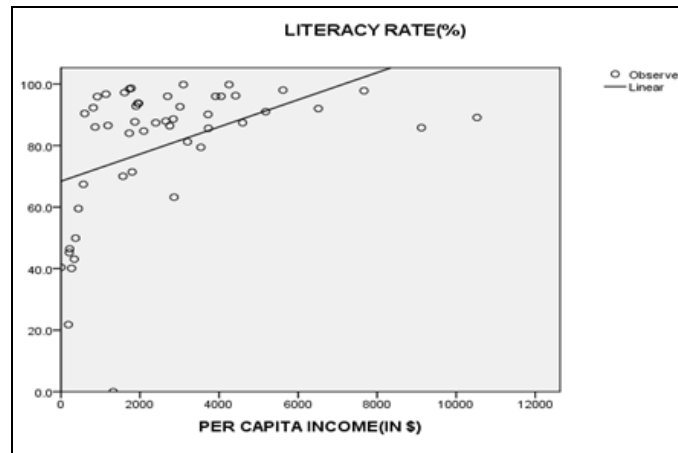


Fig. 2 Scatter Plot: Per Capita Income on Literacy Rate

Here in the above scatter plot, the same strong relation has been seen between the literacy rate and Per Capita Income. As the level of both the variables are proportional to each other strongly.

The Beta value again in this regression is positive with the magnitude of .450 which shows that the bond between the up-gradation of both the variables is much stronger as the unit change in the Per Capita Income will result as the 4.5% increase in the Literacy rate in the developing countries.

But when we further divide the countries into different categories according to the level of Per Capita Income, we get this picture:

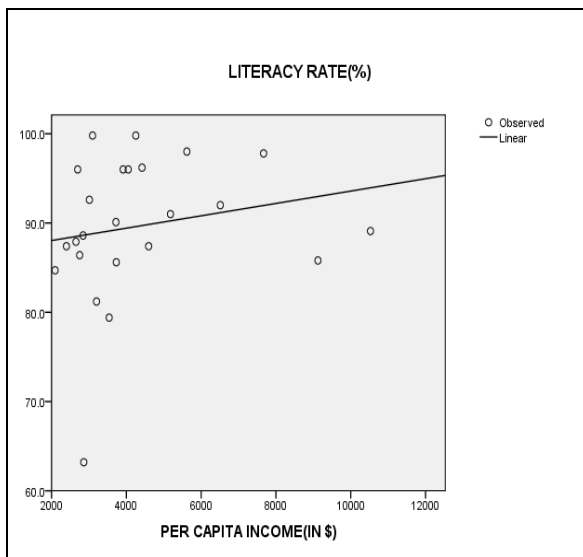


Fig. 2.1 Countries with PCI more than \$2000

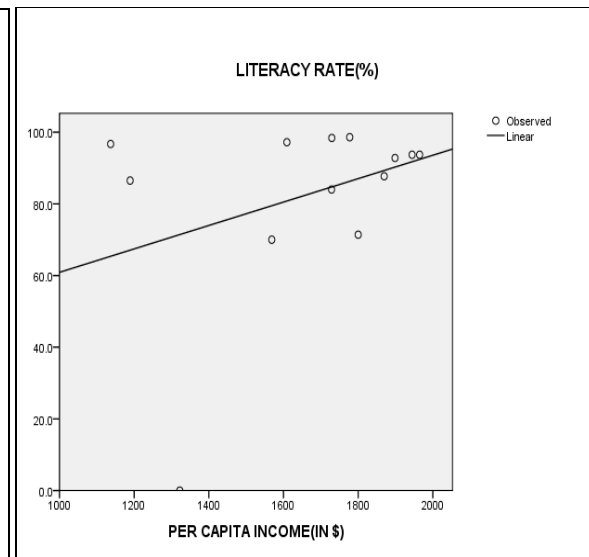


Fig. 2.2 Countries with PCI between \$1000 to \$2000

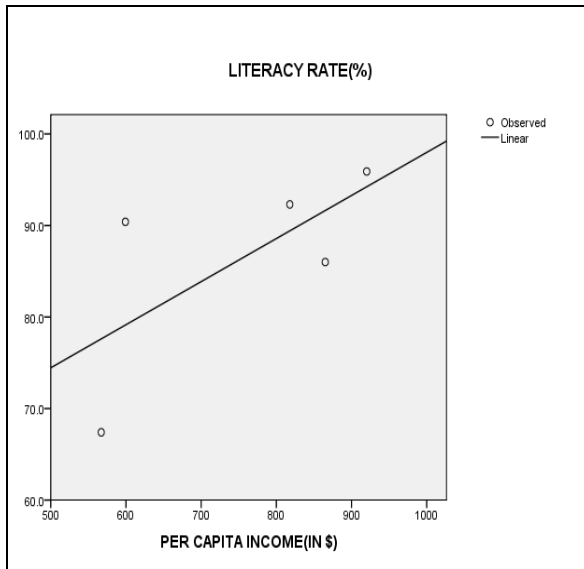


Fig.2.3 Countries with PCI between \$500 to \$1000

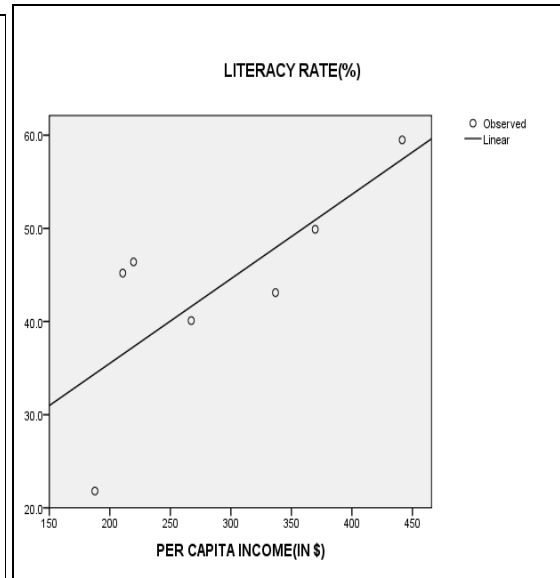


Fig. 2.4 Countries with PCI up to \$500

A more vibrant picture of the levels of income has been visible through this division, as one can easily observe that for the first figure with the countries with PCI more than \$2000 has shown that all the countries have the literacy rate more than 85%, in which a greater portion of these countries have the rate more than 90%. Similarly for the next two divisions that are the countries with PCI between \$500 and \$2000, the levels have shown a bit decline in the literacy. For the last figure that is the group of countries with the PCI up to \$500, the highest achieved literacy rate achieved by any country is 60%.

5.3. Per Capita Income and Infant Mortality Rate for Developing Countries

VARIABLES	S.E.	BETA	SIG.
Per Capita Income (In \$)	.002	-.445	.001

Table 3: Linear Regression Coefficient: Per Capita Income On Infant Mortality Rate
Dependent Variable: Imr (Per 1000 Births)

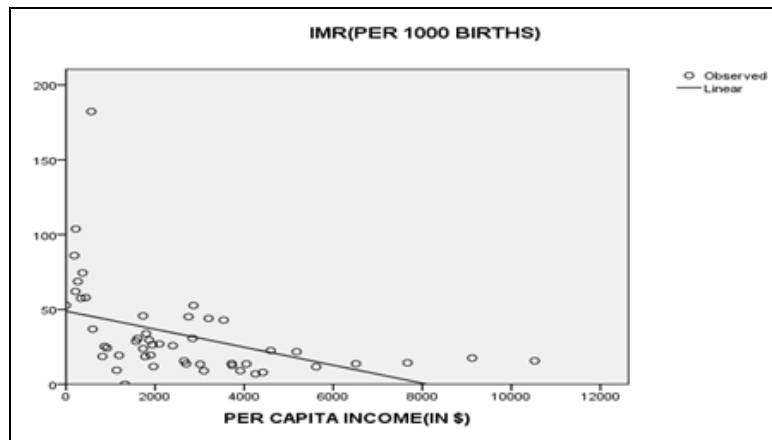


Fig. 3 Scatter Plot: Per Capita Income on Infant Mortality Rate

The Per Capita Income and IMR per 1000 births relationship for the developing countries has been visualized strongly inversely-proportional. As the Per Capita Income of the country increases, the level of Infant Mortality Rate decreases. Even the regression coefficient has been seen as much stronger as the unit change in the Per Capita Income has resulted in the decrease of 4.45% in the IMR of the countries.

As the classification of these developing countries is done under the same four heads according to the income levels-

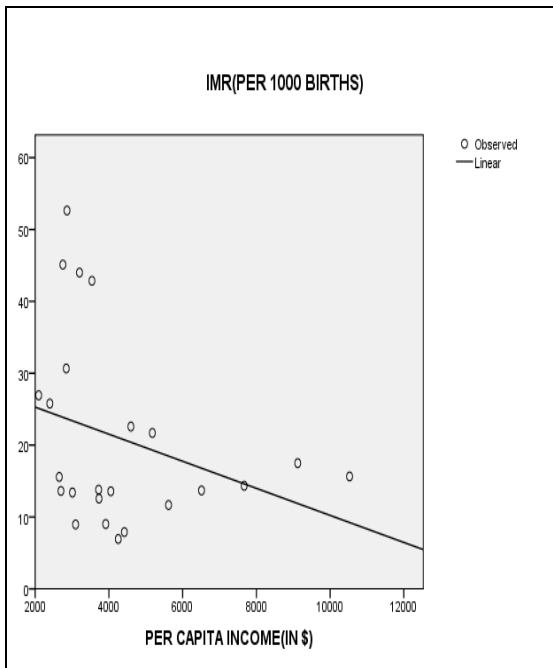


Fig.3.1 Countries with PCI more than \$2000

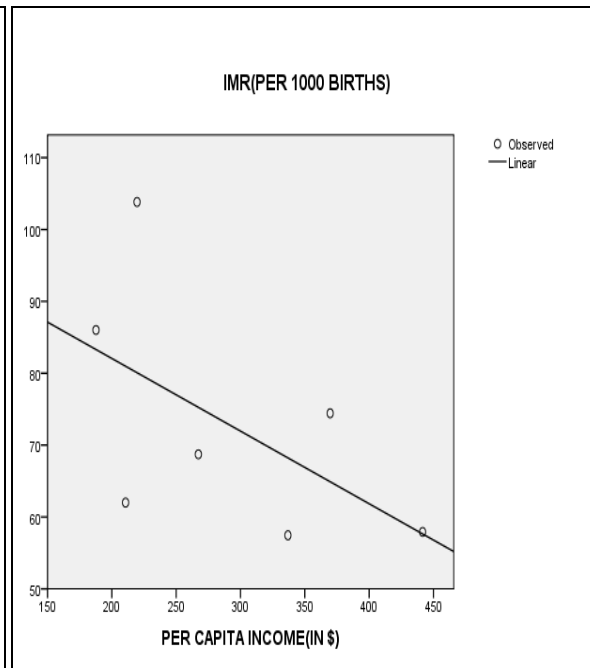


Fig. 3.2 Countries with PCI up to \$50

As one divides all the countries into the sub-groups, one has a very clear picture of the impact of the change in the Per Capita Income on the Infant Mortality Rate. As in the first scatter plot, which includes the countries with Per Capita Income more than \$2000 all the countries have less than 30 per 1000 births, whereas in case of the countries with Per Capita Income less than \$50, the lowest IMR is around 55 per 1000 births. This shows the strong impact of Per Capita Income on IMR. This difference is the result of the influence of the income standard of the household in the sense that the capability of getting the healthcare as well as the nutrition depends on the economic level of the household.

5.4. Per Capita Income and Total Fertility Rate for Developing Countries

VARIABLES	S.E.	BETA	SIG.
Per Capita Income (In \$)	.000	-.477	.001

Table 4: Linear Regression Coefficient: Per Capita Income On Total Fertility Rate
Dependent Variable: Tfr (Per Woman)

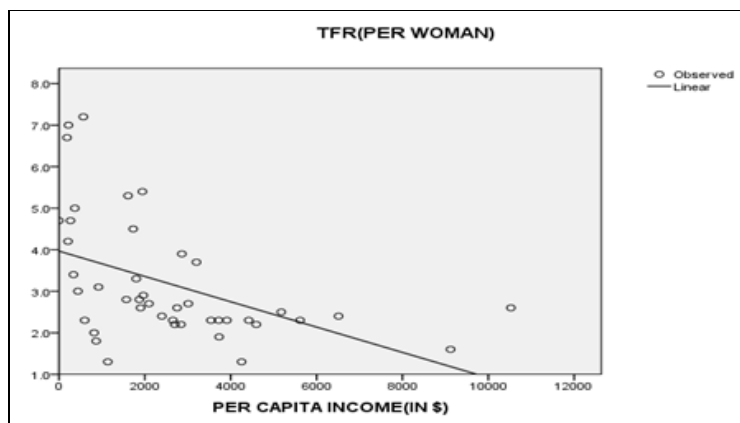


Fig. 4 Scatter Plot: Per Capita Income on Total Fertility Rate

The relation between TFR and Per Capita Income from the above scatter diagram and the regression analysis as well, is much obvious. As the Per Capita Income increases, the TFR decreases. As the regression coefficient Beta expresses that the unit change in the Per Capita Income, there would be decline of 4.77% in TFR per woman. Further the division of the countries among the four groups results as:

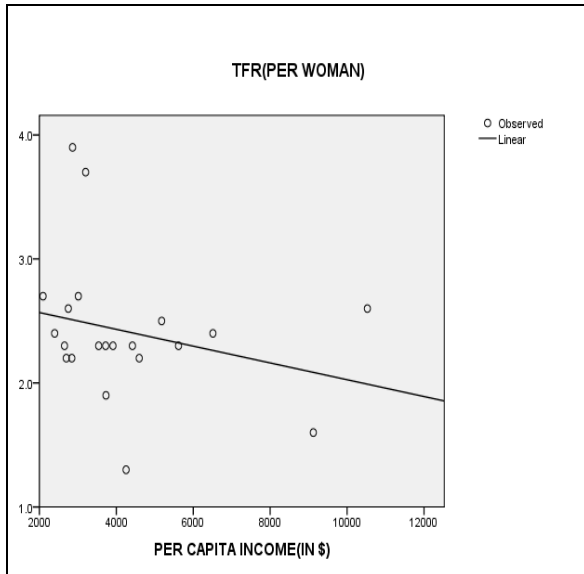


Fig. 4.1 Countries with PCI more than \$2000

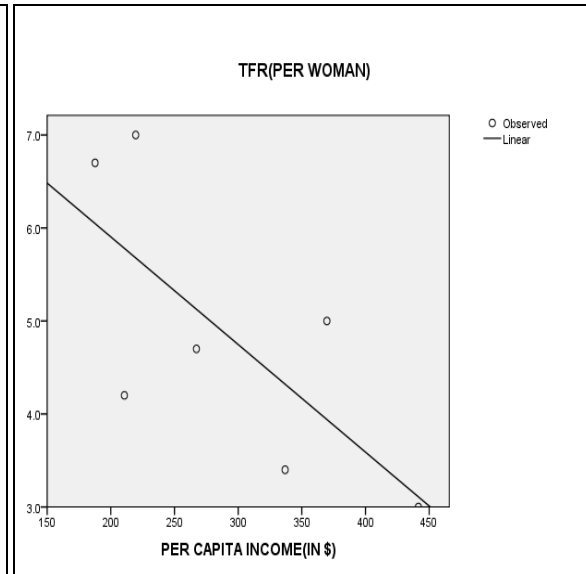


Fig. 4.2 Countries with PCI less than \$500

From the above two scatter diagrams, it is seen that the highest TFR for the countries with PCI more than \$2000 is around 2.7, whereas that in the case of countries with the PCI less than \$500 is 7 and the minimum is the upper bound of the first group that is 3 per woman. A reason behind this variation may be the quantity or quality debate of children, as in case of lower economy or for poor family, the children can be understood as the helping hands in the earning procedure that is the reason why the fertility is higher in the lower Per Capita Income' Countries.

5.5. Per Capita Income and Population Growth Rate for Developing Countries

VARIABLES	S.E.	BETA	SIG.
Per Capita Income (In \$)	.000	-.283	.047

Table 5: Linear Regression Coefficient: Per Capita Income On Population Growth Rate
Dependent Variable: Population Growth Rate (%)

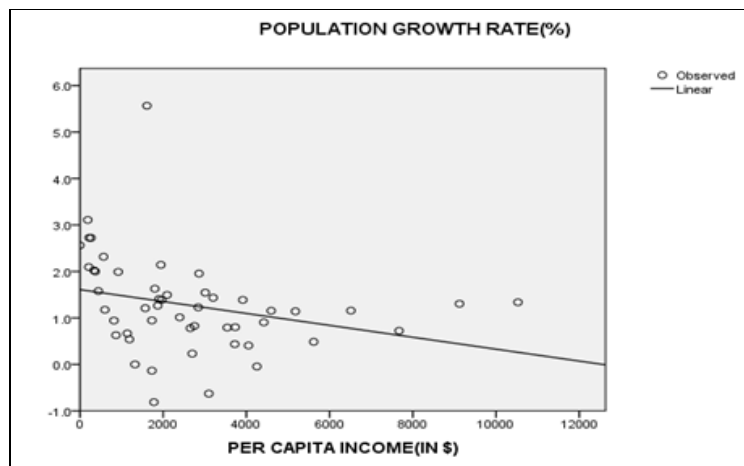


Fig. 5 Scatter Plot: Per Capita Income on Population Growth Rate

The population growth rate and the Per Capita Income of the developing countries have the but-obvious relation as the Per Capita Income increases the population growth rate decreases. The regression coefficient is $-.283$ that means for the unit change in the value of Per Capita Income for the developing countries, there will be decline of 2.83% in the value of population growth rate. Some clarification of the above may be given as: As the Per Capita Income increases, the literacy increases which impose the fertility in the negative sense as the standard of living and being ahead of others kind of thinking have been developed because the increase in the Per Capita Income.

5.6. Per Capita Income and Population below Poverty line for Developing Countries

VARIABLES	S.E.	BETA	SIG.
Per Capita Income (In \$)	.001	-.329	.047

Table 6: Linear Regression Coefficient: Per Capita Income On Population Below Poverty Line (%)
Dependent Variable: Population (%) Below Poverty Line

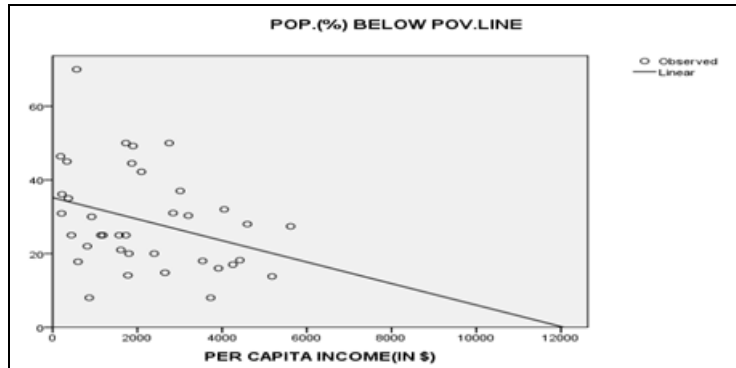


Fig. 6 Scatter Plot: Per Capita Income on Population below Poverty Line (%)

From the above scatter diagram and the regression table, it can be concluded that the increase in Per Capita Income will make the population that is living below poverty line decrease and that change will be of quantity 3.29% (neg.). Though it depends on the particular country at how the poverty has been defined but for a general demarcation with the increase in the Per Capita Income, the Population living below Poverty line decreases.

5.7. Per Capita Income and Labor Force in Agriculture for Developing Countries

VARIABLES	S.E.	BETA	SIG.
Per Capita Income (In \$)	.002	-.691	.000

Table 7: Linear Regression Coefficient: Per Capita Income On Labor Force (%) In Agriculture
Dependent Variable: Labor Force (%) In Agriculture

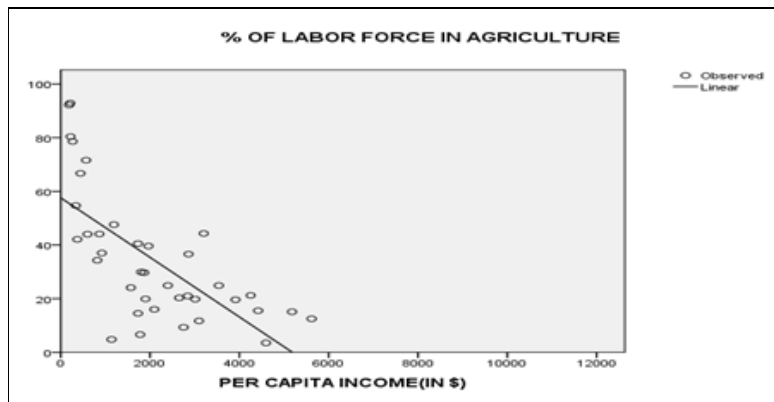


Fig. 7 Scatter Plot: Per Capita Income on Labor Force (%) in Agriculture

Both the scatter diagram and the regression analysis say that there is the adverse effect on the agriculture labor force incorporation of the increase in the Per Capita Income. The regression coefficient value is negative and the magnitude is -0.691, which means that unit change in the Per Capita Income will reduce the labor force by almost 7%. It is true in the sense that as the Per Capita Income increases the population will move towards the service sector from the Agriculture that will reduce the agricultural labor force. Further subdivision will provide us-

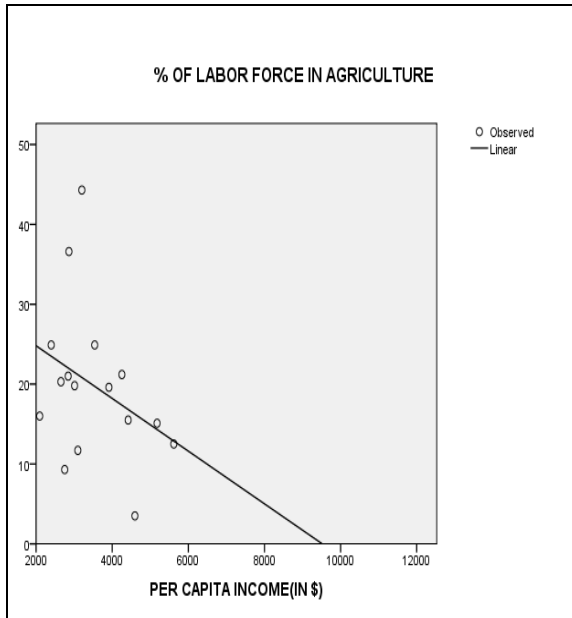


Fig. 7.1 Countries with PCI more than \$2000

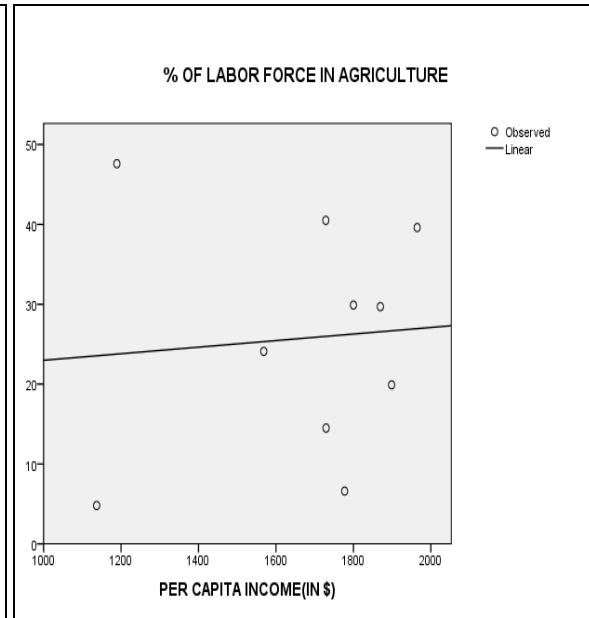


Fig. 7.2 Countries with PCI between \$1000 and \$2000

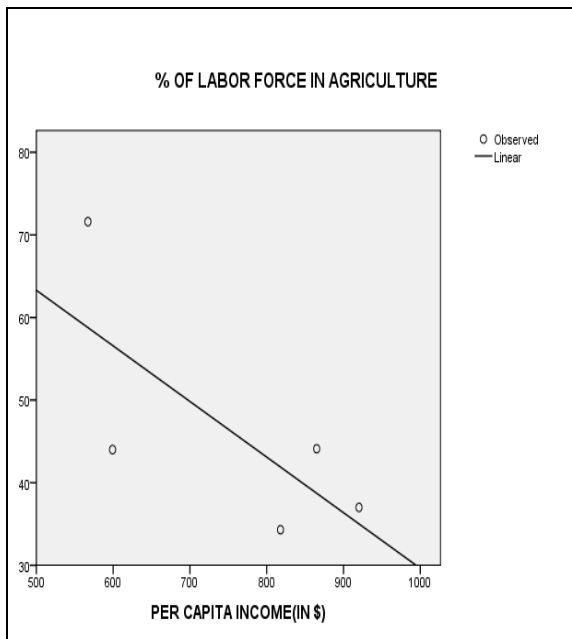


Fig. 7.3 Countries with PCI between \$500 to \$1000

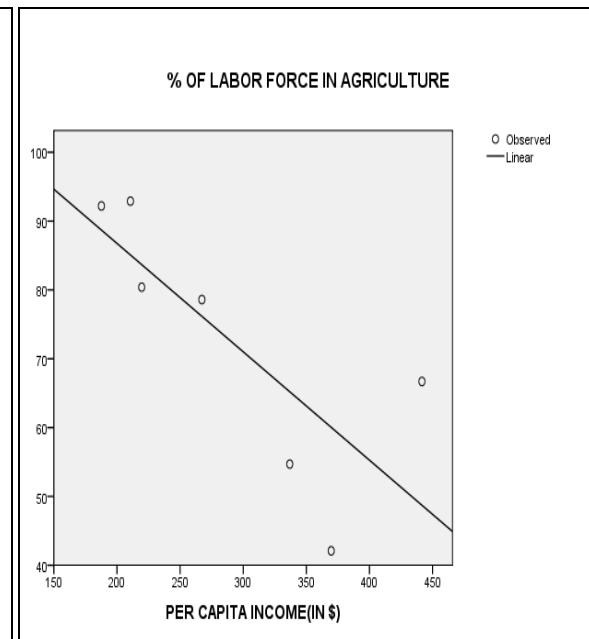


Fig. 7.4 Countries with PCI up to \$500

From the above four divisions of the developing countries according to their respective Per Capita Income and the labor force in agriculture scatter plot, though it is already clear that there is an inverse relationship but how the momentum has been changing is much interesting.

From the first graph when the PCI is very high the labor force in agriculture is highest just 25%, whereas that of in succeeding graphs when the Per Capita Income level is low the percentage of agriculture labor force is increasing as for the last graph the statistics is varying within 60% and above.

Finally if one has to summarize: since the only independent variable taken in this study is the Per Capita Income of the Developing Countries, because we have to observe the impact of this on other development indicators, one has to see the correlation with all others. And the observed results are: Per Capita Income has positive correlation with two variables those are life expectancy and literacy, whereas the negative correlation with five variables and those are: IMR, Population Growth Rate, TFR, Labor force in Agriculture and Percentage of Population living below Poverty line.

6. Conclusion

Each and every time when one talk about development, one has to take into account the income prospect either it is for an individual or for a country itself. It has achieved such place because the Per Capita Income has very high correlation with the other variables in the constituting list of Human Development Index. That is why Per Capita Income is indeed a good predictor of development, except some developing countries' scenario cannot support it always but in such situation there is not the problem is associated with the income index only it may be because of the state in which the country lie in the transition phase or may be because of the distribution.

In this paper we started with some health indicators like life expectancy and IMR, education indicator as the literacy rate, the demographic indicators like TFR and Population growth rate and some economic indicators like Population below poverty line and labor force in agriculture etc. and with all these variables the Per Capita Income has shown a high correlation and in a positive sense.

So finally, one can conclude that though a number of indicators may be used to assess the level of development in a broader scenario as in case of Human Development Index one do, yet as a summary measure/statistic/indicator PER CAPITA INCOME can be used for developing countries. Thus, *Per Capita Income of any country is Indeed a Proxy or itself a good indicator to measure the development of the country.*

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